

ESTABLISHMENT OF THREE EUROPEAN FLEA BEETLES IN NOVA SCOTIA: *LONGITARSUS GANGLBAUERI* HEIKERTINGER, *L. JACOBÆAE* (WATERHOUSE), AND *L. RUBIGINOSA* (FOUDRAS) (COLEOPTERA: CHRYSOMELIDAE: ALTICINAE)

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Abstract.—A Eurasian ragwort flea beetle, *Longitarsus jacobæae* (Waterhouse), was released in western and eastern Canada, beginning in 1971, and in the U.S. Pacific Northwest in 1969 to help control infestations of the noxious Eurasian weed, tansy ragwort (*Senecio jacobaea* L.; Asteraceae), in pastures and rangelands. In eastern Canada, *L. jacobæae* previously has been recorded as established in Prince Edward Island and New Brunswick; we report it from 5 counties in Nova Scotia. Based on collecting from 1993 to 2003, two other adventive species of *Longitarsus* are reported for the first time from Nova Scotia and the Canadian Maritime Provinces. *Longitarsus ganglbaueri* Heikertinger, known previously only from Oregon and Manitoba, is reported from two counties, and *L. rubiginosa* (Foudras), recorded only from Ontario and Quebec, is reported from two counties.

Key Words: Chrysomelidae, biological control, new records, adventive species, tansy ragwort, hedge bindweed

Tansy ragwort (*Senecio jacobaea* L.; Asteraceae), a Eurasian biennial or short-lived perennial, now infests pastures, rangelands, forest clearcuts, and disturbed areas along the Atlantic coast from Rhode Island to the Canadian Maritime Provinces and along the Pacific coast from northern California to British Columbia (ARS-USDA 1971, Coombs et al. 1991, White 1996). *Senecio jacobaea* is especially noxious because it not only competes with valuable forage plants but also contains foliar pyrrolizidine alkaloids toxic to cattle, deer, horses, and pigs (Bain 1991). Livestock poisoning usually occurs only with severe tansy ragwort infestations and when the foliage of more desirable plants is scarce (Turner and Szczawinski 1991).

Tansy ragwort, first recorded in California in 1912 and Oregon in 1922, had become an important weed on the Pacific coast by the mid-1950s (Pemberton and Turner 1990). Because of its invasive nature and lethal effects to livestock, this weed became a candidate for biological control in western North America in the late 1960s.

The ragwort flea beetle, *Longitarsus jacobæae* (Waterhouse), was deliberately introduced into western and eastern Canada (Julien and Griffiths 1998) from Italy and Switzerland. Released in Canada beginning in 1971, it became established in British Columbia, Prince Edward Island, and New Brunswick by 1982, but apparently failed to do so in Ontario or Nova Scotia (Harris et al. 1984, Julien and Griffiths 1998).

LeSage (1991) did not list *L. jacobaeae* from New Brunswick or Prince Edward Island, but Harris (2003) and Riley et al. (2003) confirmed the beetle's establishment in those provinces. Releases of *L. jacobaeae* in the United States began in 1969, and its establishment has been confirmed in California, Oregon, and Washington (Julien and Griffiths 1998). In combination with other introduced Palearctic insects, the flea beetle has provided successful biological control of tansy ragwort in Oregon (e.g., McEvoy et al. 1991) and northern California (Piper 1985, Pemberton and Turner 1990).

The Old World distribution of *L. jacobaeae* includes the British Isles, Europe, North Africa, Siberia, Kazakhstan, Kirgizia, and Dagestan (LeSage 1988, Doguet 1994). Known host plants in its native range include *Senecio jacobaea* (British Isles, continental Europe), *S. giganteus* Desf. (Morocco), and occasionally other *Senecio* species (Frick 1970, LeSage 1988). Westcott et al. (1985) reported several native species of *Senecio* as adult-feeding hosts.

During a series of survey trips to the Canadian Maritime Provinces (1993–2003), we collected numerous specimens of *L. jacobaeae* from tansy ragwort in several localities in Nova Scotia, a province in which its establishment has been considered doubtful. Examination of male genitalia verified its identity as *L. jacobaeae* rather than the morphologically similar *L. flavicornis* (Stephens) (Shute 1975).

We also collected specimens of another Palearctic *Longitarsus* in Nova Scotia, *L. ganglbaueri* Heikertinger, wherever one of its known host plants (LeSage 1988), *Senecio viscosus* L., was encountered. *Longitarsus ganglbaueri* was detected (in vacuum samples) for the first time in North America during studies related to the biocontrol of tansy ragwort in Oregon (Westcott et al. 1985). Westcott et al. (1985) also reported the species from Manitoba based on a single specimen collected in 1978. LeSage (1988) considered this flea beetle to

have been introduced accidentally into the Pacific Northwest with material of *S. jacobaeae* that was introduced intentionally from Italy. Westcott et al. (1985) and Westcott and Brown (1992), however, argued that it is naturally Holarctic or an early accidental introduction that predates the biocontrol releases of *S. jacobaeae*. It might represent an unintentional introduction in Nova Scotia because it appears not to have been introduced for biological control (Harris et al. 1984, Julien and Griffiths 1998). The species still is recorded only from Manitoba in Canada (LeSage 1991, Riley et al. 2003). In the Palearctic Region, *L. ganglbaueri* occurs in the British Isles, Ireland, Sweden to Spain, Italy, Balkans, Caucasus, and Dagestan (LeSage 1988). This *Senecio* specialist has been reported from *S. viscosus* and *S. vulgaris* L. (LeSage 1988) in Europe and from *S. jacobaea*, *S. pseudoaureus* Rydb., *S. sylvaticus* L., and *S. triangularis* Hooker in North America (Westcott et al. 1985).

Our collecting from another invasive plant, hedge bindweed (*Calystegia sepium* (L.) Br.; Convolvulaceae), in Nova Scotia yielded specimens of the Palearctic *L. rubiginosa* (Foudras). Previous North American records are limited to Ontario and Quebec (LeSage 1991, Riley et al. 2003). In the Old World, this species is known from the British Isles, central Europe, Albania, Bulgaria, Caucasus, Siberia, Turkestan, and Dagestan (LeSage 1988) and northeastern Asia (Westcott and Brown 1992). Its hosts in the Palearctic Region, in addition to *C. sepium*, include other convolvulaceous plants (LeSage 1988).

Here, we give the first Nova Scotian records for *L. jacobaeae*, *L. ganglbaueri*, and *L. rubiginosa*. We collected *L. jacobaeae* on *Senecio jacobaea*, *L. ganglbaueri* on *S. viscosus*, and *L. rubiginosa* on *Calystegia sepium*. The number of adults collected is given parenthetically. Voucher specimens of the three species are deposited in the Cornell University Insect Collection (Ithaca, New York) and the National Museum of

Natural History, Smithsonian Institution (Washington, D.C.).

MATERIAL EXAMINED

Longitarsus jacobaeae (Waterhouse).—CANADA: Nova Scotia: Antigonish Co., Antigonish, 30 July and 3 August 2003 (6). Cape Breton Co., Glace Bay, Renwick Park, 1 August 2003 (9); North Sydney, 24 July 1995 (58), 2 August 2003 (3); Sydney, 23 July 1995 (112), 31 July 2003 (11). Inverness Co., Port Hawksbury, 31 July 2003 (13). Pictou Co., Pictou marine terminal, 30 July 2003 (20); Rte. 106, Caribou, 30 July 2003 (4). Yarmouth Co., Yarmouth, 20 July 1994 (43), 6 August 2001 (67).

Longitarsus ganglbaueri Heikertinger.—CANADA: Nova Scotia: Colchester Co., Truro, nr. railroad tracks, 21 July 1994 (15), 29 July 2003 (11). Halifax Co., Dartmouth, 3–8 August 2001 (23), 27–28 July 2003 (3); Halifax, nr. old railroad station, 26 June 1993 (8); 2 August 2001 (9).

Longitarsus rubiginosa (Foudras).—CANADA: Nova Scotia: Annapolis Co., Port George, 5 August 2001 (11); Bridgetown, Jubilee Park, 5 August 2001 (15). Shelburne Co., Shelburne, 20 July 1994 (7).

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